IRON ORE CREEK BRIDGE
(Loy Lake Park Bridge)
Texas Historic Bridges Recording Project
Loy Lake County Park (moved from County Route 597
at Iron Ore Creek)
Denison Vicinity
Grayson County
Texas

HAER No. TX-38

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
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HISTORIC AMERICAN ENGINEERING RECORD

IRON ORE CREEK BRIDGE
(Loy Lake Park Bridge)

HAER No. TX-38

Location:	Loy Lake Park, Denison vicinity, Grayson County, Texas. (Moved from Iron Ore Creek at County Route 597, Denison vicinity, Grayson County, Texas.) UTM: 14/725440/3733390 USGS: Sherman, Texas, quadrangle.
Date of Construction:	Circa 1911.
Builder:	Midland Bridge Company, Kansas City, Missouri.
Present Owner:	Grayson County.
Present Use:	Pedestrian bridge.
Significance:	This 60'-9"-long, twelve-panel riveted Warren pony truss was built around 1911 by the Midland Bridge Company of Kansas City, Missouri. It originally spanned Iron Ore Creek at Grayson County Route 597, but has been relocated to Loy Lake Park near Denison, Texas. It survives in its present location as one of only a few extant bridges erected by the Midland Bridge Company in Texas, and in its original location it served as an important local transportation link in the development of Grayson County's agricultural economy.
Historian:	Robert W. Jackson, August 1996.
Project Information:	This document was prepared as a part of the Texas Historic Bridges Recording Project performed during the summer of 1996 by the Historic American Engineering Record (HAER). The project was sponsored by the Texas Department of Transportation (TxDOT).

Development of Grayson County

The economy of Grayson County has had a strong foundation in agriculture since it was created by the Texas legislature on March 17, 1846, shortly after Texas was annexed to the United States. Named for Texas attorney general Peter Grayson, the county is drained principally by Choctaw Creek and its two main tributaries, Post Oak Creek and Iron Ore Creek. The northern portion of the county drains into the Red River, while the southern portion drains into tributaries of the Trinity River.[1]

Prior to the introduction of two railroad lines into the county in 1872, supplies from the east came into the area either by ox-pulled wagon trains from Jefferson, Texas, or by boats navigating the Red River, with landings at Shawneetown and at Preston.[2] Any products or goods received or shipped from these points had to be carried by wagon across the county's creeks at low-water crossings. The distances to be traveled and the number of creeks to be traversed were limiting factors in the expansion of the county's economy. These limitations were eased considerably with the introduction of the railroad in 1872.

On Christmas Eve of that year the first train of the Missouri, Kansas, and Texas Railroad reached the town of Denison. Denison was established by the railroad as a counter to the October 1872 introduction of the Houston and Texas Central Railroad into the county seat at Sherman, located approximately eight miles to the southwest. The Texas and Pacific Railroad came to Sherman in April 1875, and the Cotton Belt Line arrived in 1888.[3]

These railroads facilitated the development of the regional economy because they made it easier for finished manufactured goods, including the metal truss bridges needed to span creeks, to be shipped into the area.[4] They also created a number of points at which goods and produce could be shipped out of the county. Thus, area creeks became somewhat less of a barrier to commerce than they had been previously.

Following the introduction of the railroads, manufacturing and milling operations steadily expanded in the county, but the area economy remained predominately agricultural. The number of farms increased each year, reaching a high of 5,762 in 1900. The county recorded the highest production of corn in its history in 1900 with 3,681,640 bushels produced. High yields of wheat

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[1] Donna J. Kumler, "Grayson County," *The New Handbook of Texas,* ed. Ron Tyler, vol. 3 (Austin: Texas State Historical Association, 1996), p. 298.

[2] Mattie Davis Lucas and Mita Holsapple Hall, *A History of Grayson County, Texas* (Sherman, Texas: Scruggs Printing Company, 1936), p. 90.

[3] Ibid., pp. 164-65.

[4] Graham Landrum and Allen Smith, *Grayson County: An Illustrated History* (Fort Worth: Historical Publishers, 1967), p. 8.

and cotton were also achieved, and commercial orchards flourished. Farms accounted for 553,527 of the county's 602,880 acres by 1910.[5]

A bill passed by the state legislature in 1903 empowered county commissioners' courts to issue bonds for road and bridge building, but development of the county transportation network was very slow. In 1908, Denison businessmen concerned with the poor condition of the county's transportation network established "Good Roads Districts" in an effort to facilitate the construction of new roads and bridges.[6] Between 1910 and 1912 the first macadamized road in Texas was built from Denison to Carpenter's Bluff on the Red River, and the first county-wide road system, virtually all gravel, was established in 1915.[7] However, in the first decade of the century most of the roads in Grayson County were dirt, and the bridges erected across these roads were designed to serve only one lane of wagon traffic.

Midland Bridge Company

It was during these early years of the century that Midland Bridge Company expanded its operations into Grayson County. The firm, which began operation as a partnership of Henry Freygang and A. A. Trocon, was first listed in Hoye's Directory of Kansas City, Missouri in 1900. It continued to be listed in successive directories, with occasional changes of address, until 1927. An advertisement in the 1904 *Kansas State Gazetteer* lists Freygang and Trocon as proprietors of the company, with both men indicated as registered civil engineers and Trocon listed as a member of the American Society of Civil Engineers. This advertisement also announces the proprietors as "designers and builders of bridges, viaducts, foundations, steel structures, buildings, etc." Hoye's 1921 Directory lists Trocon as president, Freygang as vice president, and Ray L. Cargill as secretary-treasurer. Freygang is also reportedly shown in one city directory as residing in Houston, Texas, in 1921. In 1922 the name of the firm changed to Midland Bridge and Construction Company with A. A. Trocon as manager. Corporate offices were also located in Augusta, Maine, from July 1920, with E. M. Leavitt as president, Albert Trocon as vice president, Ray Cargill as secretary, and L. E. Haskell as treasurer.

The company specialized in small trusses such as the type needed on farm-to-market roads, and did a considerable amount of business during the first two decades of the twentieth century. Midland bridges have been found in Arizona, Colorado, Idaho, Iowa, Kansas, Montana, Nebraska, New Mexico, Utah, and Wyoming. The firm fabricated and erected a wide variety of

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[5] Kumler, p. 299.

[6] B. McDaniel, "Highway Administration in Grayson County, Texas" (M.A. thesis, University of Texas at Austin, 1929), pp. 97-99.

[7] Sherrie S. McLeRoy, *Black Land, Red River: A Pictorial History of Grayson County, Texas* (Virginia Beach, Virginia: Donning Company, 1993), p. 107; Kumler, p. 299.

roadway and rail bridges, including Pratt through trusses, Pratt pony trusses, truss leg bedstead pony trusses, Parker through trusses, Warren pony trusses with verticals, the only known concrete rainbow arch built in New Mexico, and one of only two extant vertical-end-post Parker through trusses in Kansas.

The most unusual design of the company is probably the Cameron Bridge (Little Colorado River Bridge) constructed in 1911 over the Little Colorado River at U.S. Route 89 in Coconino County, Arizona. Designed by Midland chief engineer W. H. Code and erected in 1911, this is a long-span steel suspension bridge with braced steel towers and a pin-connected Pratt through truss. The largest bridge Midland is known to have erected was the Old St. Charles Bridge in 1904 over the Missouri River.[8]

In addition to the Iron Ore Creek Bridge, the known work of Midland Bridge Company in Grayson County includes three pin-connected Parker through trusses measuring about 675 feet in overall length, erected across the Red River at Colbert's Ferry in 1912.[9] Another bridge, identical to the Iron Ore Creek Bridge and probably built by Midland, was erected about 1911 on the old Bells Highway between Denison and Bells. When U.S. Route 69 was built, this span was moved to Pilot Grove in southeastern Grayson County. In 1953 it was again moved to a point about seven miles east of Denison where it was used to span Iron Ore Creek.[10] Another Midland-built bridge has been identified in neighboring Fannin County (built around 1911), and the firm is known to have built the Denton Creek Bridge in Dallas County about 1912. The full extent of the operations of this company in Texas is unknown, but it is likely that a number of yet unidentified bridges were erected by Midland in north Texas in the period between 1900 and 1928.

Iron Ore Creek Bridge

The Iron Ore Creek Bridge is not unusual in terms of its basic design. The Warren pony truss is a very common bridge type, particularly well suited for use on secondary, moderately traveled roads such as those serving rural areas of Grayson County. In its original form, the truss is composed of a series of equilateral triangles, without any vertical members. The diagonals

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[8] Clay Fraser, letter to Michael S. Weichman, Senior Archaeologist, Division of Parks, Recreation, and Historic Preservation, Jefferson City, Missouri, 21 April 1994; Larry Jochims (Kansas State Historical Society, Topeka, Kansas), letter to the author, 26 June 1996.

[9] U.S. Department of the Interior, Historic American Engineering Record (HAER) No. TX-27, "Denison-Durant Bridge," 1993, revised 1995, p. 5, Prints and Photographs Division, Library of Congress, Washington, D.C.

[10] "Old Bridge Doesn't Die, It Just Keeps Moving," *Dallas Morning News,* 26 July 1953, p. 20.

function both as compression and tension members, and without counters or verticals the midspan members can suffer from stress reversal under certain loads.

British engineers James Warren and Willoughby Monzani built the first Warren truss in 1846, and patented the design in England in 1848. Unaware of the British patent, Squire Whipple built the first Warren truss in American a few years after it was introduced in England. Due to the potential problems caused by stress reversal at midspan, such as excessive wear at pin connections, the design was initially slow to catch on in America. However, as bolts and rivets began to replace pin connections toward the end of the nineteenth century, the form began to gain wider acceptance. Warren trusses were often built with vertical members which stiffen the entire structure, and in this configuration the design eventually became very popular.[11]

Like most surviving Warren trusses, the Iron Ore Creek Bridge was built with vertical members.[12] One design aspect of the bridge worthy of note is that all diagonal and vertical members are laced, except for the first two diagonals at either end of the span. These members are solid steel channels.

The inclined end posts and top chord are made of steel I-beams measuring 1'-0" x 4 7/8" and 1/8" thick. These members are stamped "Cambria," indicating that they were rolled by the Cambria Steel Company of Johnstown, Pennsylvania.[13] This company was one of the most important iron and steel producing facilities in America during the second half of the nineteenth century, and was greatly increasing its production of finished products during the period when Midland was most active in Texas.[14]

The laced verticals of the bridge are 2 1/2" x 1 1/2" angles, laced together with 13" long, 1 3/4" wide lacing bars. The gusset plates connecting the verticals and diagonals at the top and bottom are 5" x 11 3/4" rectangles made of 1/8" thick steel. The top and bottom rails are 1 3/8" x 3" channels, supported by 3" x 2 1/2" vertical angles at the ends. The railing is 60'-8 3/4" long, and since the outside end of the bearing plates are where the end verticals of the railing

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[11] Carl Condit, *American Building Art: The Nineteenth Century* (New York: Oxford University Press, 1960), pp. 117-18; James Cooper, *Iron Monuments to Distant Posterity: Indiana's Metal Bridges, 1870-1930* (Indianapolis: Pierson Printing, 1987), p. 84.

[12] T. Allen Comp and Donald Jackson, "Bridge Truss Types: A Guide to Dating and Identifying," *History News* 32, No. 5 (May 1977).

[13] Gray Fitzsimons, ed., *Blair County and Cambria County, Pennsylvania: An Inventory of Historic Engineering and Industrial Sites* (Washington, D.C.: National Park Service, 1990), p. 259.

[14] Paul F. Paskoff, ed., *Encyclopedia of American Business History and Biography: Iron and Steel in the Nineteenth Century* (New York: Bruccoli Clark Layman and Facts on File, 1989), pp. 38, 42.

terminate, the length of the rail is also the length of the truss. The floor beams are 15" x 3 3/8" channels made of 1/8"-thick steel. The entire structure is riveted.

The Iron Ore Creek Bridge was stripped, primed and repainted when moved to its present location in Loy Lake Park near Denison, and is in good condition. It should survive well into the twenty-first century as a valuable artifact from an important period in the history of Grayson County, and as a rare example of the work of the Midland Bridge Company in Texas.

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APPENDIX A: Suggestions For Further Research

Due to limitations in the scope of the Texas Historic Bridges Recording Project, several questions which arose during the research and writing of this report remain unanswered. It is suggested that scholars interested in this bridge consider pursuing the following:

1. What was the exact date of erection?

2. What was the cost of the bridge?

3. Who served as agent of the Midland Bridge Company in north Texas?

APPENDIX B: Sketch Elevation and Plan